

IN THE CLAIMS:

1. (Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:

a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and

a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity ~~applies at least one sustain pulse~~ to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein a pulse waveform of each sustain pulse is determined so that a particular current waveform is formed when the sustain pulse is applied, the particular current waveform being a waveform in which a time from when a peak is reached to when a fall is completed is no more than triple a time from when a rise is started to when the peak is reached.

2. (Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:

a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and

a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity ~~applies at least one sustain pulse~~ to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein immediately before a leading edge of each sustain pulse which is applied to the

discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

3. (Original) The panel display apparatus of Claim 2,
wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than an absolute value of a voltage of the sustain pulse.

4. (Original) The panel display apparatus of Claim 3,
wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 100ns.

Claim
5. (Original) The panel display apparatus of Claim 3,
wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 50ns.

6. (Original) The panel display apparatus of Claim 2,
wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than 1.5 times an absolute value of a voltage of the sustain pulse.

7. (Original) A panel display apparatus for displaying an image in a discharge sustain period, comprising:

a gas discharge panel in which a plurality of discharge cells are arranged in the form of

matrix between a pair of substrates; and

a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

8. (Original) The panel display apparatus of Claim 7,

wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than an absolute value of a voltage of the sustain pulse.

9. (Original) The panel display apparatus of Claim 8,

wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 100ns.

10. (Original) The panel display apparatus of Claim 8,

wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 50ns.

11. (Original) The panel display apparatus of Claim 7,

wherein an absolute value of a voltage of the pulse that is opposite in polarity to the

sustain pulse is no smaller than 1.5 times an absolute value of a voltage of the sustain pulse.

12. (Amended) A panel display apparatus comprising:

a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and

a driving circuit which accumulates a wall charge on the dielectric to write an image, and successively applies a plurality of sustain pulses which alternate in polarity ~~applies at least one sustain pulse~~ between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,

wherein immediately before a leading edge of each sustain pulse which is applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period.

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13. (Original) The panel display apparatus of Claim 12,

wherein the driving circuit applies the pulse of the opposite polarity and the sustain pulse between the pair of first and second electrodes, by applying two rectangular pulses that are opposite in polarity, respectively to the first electrode and the second electrode.

14. (Original) A panel display apparatus comprising:

a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and

a driving circuit which (a) accumulates a wall charge on the dielectric to write an image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,

wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period.

15. (Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:

about a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and

a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity ~~applies at least one sustain pulse~~ to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein an absolute value of a voltage of each sustain pulse which is applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

16. (Original) The panel display apparatus of Claim 15,

wherein a highest absolute value of the voltage of the sustain pulse in the first period exceeds an absolute value of a discharge firing voltage of the discharge cell, and

the absolute value of the voltage of the sustain pulse in the second period is below the absolute value of the discharge firing voltage of the discharge cell.

17. (Original) The panel display apparatus of Claim 16,

wherein a time during which the absolute value of the voltage of the sustain pulse exceeds the absolute value of the discharge firing voltage is no more than 100ns.

18. (Original) The panel display apparatus of Claim 15,

wherein immediately after the trailing edge of the sustain pulse, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

19. (Original) A panel display apparatus comprising:

a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates; and

a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write an image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein an absolute value of a voltage of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell is higher during a first period than a second

period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

20. (Original) The panel display apparatus of Claim 19,
wherein a highest absolute value of the voltage of the sustain pulse in the first period exceeds an absolute value of a
discharge firing voltage of the discharge cell, and
the absolute value of the voltage of the sustain pulse in the second period is below the absolute value of the discharge firing voltage of the discharge cell.

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21. (Original) The panel display apparatus of Claim 20,
wherein a time during which the absolute value of the voltage of the sustain pulse exceeds the absolute value of the discharge firing voltage is no more than 100ns.

22. (Original) The panel display apparatus of Claim 19,
wherein immediately after the trailing edge of the sustain pulse, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

23. (Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:
a gas discharge panel in which a plurality of discharge cells are arranged in the form of

matrix between a pair of substrates; and

a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity ~~applies at least one sustain pulse~~ to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein immediately after a trailing edge of each sustain pulse which is applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

24. (Original) The panel display apparatus of Claim 23,
wherein the predetermined period is no more than 100ns.

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25. (Original) A panel display apparatus comprising:

a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates; and

a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write an image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein immediately after a trailing edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

26. (Original) The panel display apparatus of Claim 25,
wherein the predetermined period is no more than 100ns.

27. (Amended) A panel display apparatus comprising:
a gas discharge panel in which a plurality of pairs of first and second electrodes covered
with a dielectric are arranged between a pair of substrates; and
a driving circuit which accumulates a wall charge on the dielectric to write an image, and
successively applies a plurality of sustain pulses which alternate in polarity ~~applies at least one~~
~~sustain pulse~~ between each pair of first and second electrodes to perform a sustain discharge in
areas where the wall charge has been accumulated,

Amend wherein when applying each sustain pulse between the pair of first and second electrodes,
the driving circuit

applies a first voltage between the pair of first and second electrodes for a fixed period
from a leading edge of the sustain pulse, and

applies a second voltage between the pair of first and second electrodes for a period from
a lapse of the fixed period to a trailing edge of the sustain pulse, the second voltage having a
smaller absolute value than the first voltage.

28. (Original) The panel display apparatus of Claim 27,
wherein the driving circuit applies the first and second voltages between the pair of first
and second electrodes, by applying two pulses that are same or opposite in polarity and overlap
in time, respectively to the first electrode and the second electrode.

29. (Amended) A panel display apparatus comprising:

a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and

a driving circuit which accumulates a wall charge on the dielectric to write an image, and successively applies a plurality of sustain pulses which alternate in polarity ~~applies at least one sustain pulse~~ between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,

wherein immediately after a trailing edge of each sustain pulse which is applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period.

30. (Original) The panel display apparatus of Claim 29,

wherein the driving circuit applies the sustain pulse and the pulse of the opposite polarity between the pair of first and second electrodes, by applying two pulses that are same in polarity and overlap in time, respectively to the first electrode and the second electrode.

31. (Amended) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:

a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and

a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, applying at least one sustain pulse to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, immediately before a leading edge of each sustain pulse which is applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period.

32. (Original) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:

a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and

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a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period.

33. (Amended) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:

a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and

a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, applying at least one sustain pulse to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, an absolute value of a voltage of each sustain pulse which is applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

34. (Amended) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:

a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and

a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, applying at least one sustain pulse to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, immediately after a trailing edge of each sustain pulse which is applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period.
